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Psychology's Mentalist Paradigm and the Religion/Science Tension

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ABSTRACT: Science traditionally has favored a strictly objective, value-free description of brain function and behavior that ultimately excludes freedom of will, conscious purpose, subjective value, morality, and other subjective phenomena that are vital to religion. The consequent incompatibility of science even with liberal theology no longer holds for psychology's new mentalist (cognitive) paradigm in which the formerly excluded subjective mental states now have become legitimate, ineliminable explanatory constructs as interactive emergent properties of brain processing. These mentalistic revisions invoke emergent forms of causal control that transform conventional scientific descriptions of both human and nonhuman nature, presenting a new fundamental philosophic position that integrates positivistic thought with phenomenology and opens the way for a consistent naturalistic foundation for both scientific and religious belief. It is suggested that the new mentalist outlook, which combines macro- with microdeterminism, represents a more valid determinist framework for all science.

Long-standing differences in the kinds of beliefs upheld by science and religion concerning the nature and origins of humankind and the universe and the kinds of forces in control go to the central foundations of human value priorities wherein are said to lie the sources, and possibly answers, to some of the most ominous problems of our times. It is a privilege and no small challenge to help explore these critical and timely issues.

As a scientist, my world outlook with regard both to human and nonhuman nature underwent a major conversion during the mid 1960s. Long-trusted principles in neuroscience and behaviorist doctrine had proclaimed a full account of brain function and behavior to be possible in strictly objective physicochemical and physiological terms, with no reference to conscious experience. The physiological account was taken to be complete within itself, leaving no place for conscious subjective influences. These principles, which always had seemed to be airtight and irrefutable, were discovered to have a logical flaw or shortcoming and to be outweighed by a new "emergent interactionist" reasoning with wide application throughout nature (Popper, 1965/1972; Sperry, 1965).

A modified formula for mind–brain interaction was perceived in which conscious mental states, as emergent properties of brain processes, could interact functionally at their own level and also exert downward causal control over brain physiology in a supervenient sense. It meant a radical turnaround in accepted notions in science regarding the relation of the conscious mind to the physical brain. As a result, I renounced my earlier views in favor of a new *mentalist* position in which the traditionally rejected subjective mental qualities of inner experience were conceived to play an active, causal control role in conscious behavior and evolution.

Scientific Turnabout on Consciousness

The new reasoning was later presented to the National Academy of Sciences and to psychology and neuroscience (Bindra, 1970; Sperry, 1969, 1970). By the mid-1970s, mainstream psychology had also revised its earlier views concerning consciousness and the subjective, replacing long dominant behaviorist theory with a new mentalist or cognitive paradigm. This changeover, impelled by a large complex of cognitive, linguistic, computer, and related theoretic and sociologic developments (Chomsky, 1959; Dember, 1974; Gardner, 1985; Hilgard, 1980; Matson, 1971; Miller, Galanter, & Pribram, 1960; Neisser, 1967; Sperry, 1987), has now legitimized the contents of inner experience, such as sensations, percepts, mental images, thoughts, feelings, and the like, as ineliminable causal constructs in the scientific explanation of brain function and behavior.

In what follows, I discuss religion and science from the standpoint of this recent paradigm shift in behavioral science as a whole, not from the standpoint of personal philosophy. It is important for present purposes to emphasize this paradigm's basis in mainstream psychology, not personal opinion. The arguments have support in the working conceptual framework of a whole scientific discipline—the discipline that specializes in mind and behavior. What we are dealing with essentially, I believe, is a shift in science to a different and more valid form of causal determinism equally applicable in all the sciences, not just psychology.

The answer to the question, "Is there convergence between science and religion?" seems from the standpoint of psychology to be a definite and emphatic "yes." Over the past 15 years, changes in the foundational concepts of psychology instituted by the new cognitive or mentalist paradigm have radically reformed scientific descriptions of human nature and the conscious self. The resultant views today are less atomistic, less mechanistic, and more mentalistic, contextual, subjectivist, and humanistic. From the standpoint of theology, these new mentalistic

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tenets, which no longer exclude on principle the entire inner world of subjective phenomena, are much more palatable and compatible than were those of the behaviorist–materialist era. Whereas science and religion had formerly stood in direct conflict on this matter, to the point even of being mutually exclusive and irreconcilable, one sees now a new compatibility, potentially even harmony with liberal religion—defined as religion that does not rely on dualistic or supernatural beliefs, forms of which have become increasingly evident in contemporary theology (e.g., Burhoe, 1970; Kaufman, 1985; Starr, 1984). A similar reconciliation applies in respect to the growing gulf between scientists and humanists in the two cultures described by C. P. Snow (1959) and rooted in basic contradictions between the worldview of science and that upheld in the humanities (W. T. Jones, 1965).

Before proceeding further, it may help to say a little more about the theoretical turnabout in psychology on which these alleged convergences directly depend. The mentalistic developments in question are not vague, abstract, or obscure, nor are they a matter of wishful thinking. The swing in behavioral science during the 1970s away from long dominant, rigorously objective, behaviorist doctrine to a new explanatory framework that accepts consciousness and the subjective is widely recognized and well documented (Baars, 1986; Davidson & Davidson, 1980; Dember, 1974; Fodor, 1981; Gardner, 1985; Hilgard, 1980; Kantor, 1979; Matson, 1971; Pylyshyn, 1973; Reese & Overton, 1972; Segal & Lachman, 1972; Skinner, 1985). This theoretic shift occurred with remarkable suddenness in the early 1970s (Pylyshyn, 1973), after behaviorism had reigned for more than half a century. Representing an about-face in the scientific conception and treatment of the relation of mind and brain, it has come to be referred to as the "consciousness," "cognitive," or "mentalist" revolution. It has also been called the "humanist" or "third" revolution (Matson, 1971), and it appears to constitute a true shift of paradigm in the sense described by Kuhn (1970).

The new mentalist thinking brings basic revisions of causal explanation that provide scientists and all of us with a new philosophy, a new outlook, a new way of understanding and explaining ourselves and the world. The full range of the contents and qualities of inner experience (that comprise the realm of the humanities) are not only given a new legitimacy in science but are also given primacy over the more basic physicochemical forces. The higher, more evolved, macro forces supersede the less evolved micro forces in control hierarchies. A new solution to the age-old mind–brain problem is involved, as well as a revised form of causation. The changed status in science of subjective values alters the relations between science and ethico-moral reasoning. These collective changes bring revised answers to the question, "What does modern science leave to believe in?" and affect traditional tensions between science and religion in a number of ways.

Mutually Exclusive Worldviews

It seems fair to say that prior to the mentalist revolution, up through the late 1960s, mainstream science and religion actually had stood to one another as archenemies. All through the behaviorist–materialist era, science had been upholding a value-devoid, physically driven cosmos, ultimately lacking in those subjective humanistic attributes with which religion is most concerned. Things such as moral values, the human spirit, purpose, dignity, and freedom to choose, if they existed at all, were supposed to be only inconsequential epiphenomena or passive attributes of physical brain activity and best ignored in scientific explanation because, supposedly, they in no way changed the course of events in the real world, either in the brain or in the universe at large.

The foregoing characterization of pre-1970s science and religion as "archenemies" may appear a bit harsh in view of seeming exceptions such as Ralph Burhoe's Institute of Religion in an Age of Science (IRAS) and the associated *Zygon: Journal of Religion and Science* (Burhoe, 1970). It is presupposed, however, that I am discussing *mainstream* science and religion. It has long been a stated policy in both the IRAS and *Zygon* that the attempt to join science and religion must be based on solid, mainstream science, not on fringe activities and minority opinions that might try to pass as science (Burhoe, 1967). For this reason, the IRAS project was constrained by policy to try to merge religion with the then-prevailing materialist, reductionist doctrines of mainstream science. This was taken to mean, of course, that religion must be merged with radical behaviorism, sociobiology, the selfish gene concept, the quantum mechanics cosmos, and all the other reductive, mechanistic, atomistic views upheld in traditional scientific materialist thinking. Despite the good intentions and perseverance in this direction over several decades, this project never really succeeded from the standpoint of religion. It failed to remedy, in the words of W. T. Jones (1965), "the brute factuality . . . of cosmic meaninglessness . . . of life and death in an absurd, amoral universe" (p. 20), a world indifferent to humanity and its purposes.

The actual relation of religion to traditional mainstream science seems to have been more realistically assessed by the Council of the National Academy of Sciences when they issued in 1981 the following resolution, quoted in the Academy's booklet on *Science and Creationism:* "Religion and science are separate and mutually exclusive

This article is based on an invited address to a conference on religion and science organized by the Committee on Human Values of the National Conference of Catholic Bishops, held in Plymouth, Michigan, September 1986. The assigned theme, "Is there a convergence in your discipline with religion?" was separately addressed by three other scientists representing physics, evolutionary theory, and biology. Advance instructions imposed no restrictions: "Feel free to do what you wish with the subject . . . the committee is interested in getting the important issues surrounding the religion/science tension on the table." I thank Erika Erdmann and three anonymous reviewers for their helpful comments. Support for the present work was provided from the C. Ed Nix and Doris J. Stein Funds and by the Ralph L. Smith Foundation.

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realms of human thought, presentation of which in the same context leads to misunderstanding of both scientific theory and religious belief" (National Academy of Sciences, 1984, p. 6). In other words, acceptance of the reductive physicalist beliefs traditionally upheld in science logically destroys the kinds of beliefs upheld in religion and vice versa. As already stressed, this mutually exclusive "archenemy" status is today a thing of the past, at least in behavioral science, as a result of the mentalist or cognitive revolution.

A Third Choice

Where formerly it had come down to a choice, in the last analysis, between two mutually contradictory accounts of the nature and origins of humankind and the universe, we now have a third choice in the new mentalist paradigm. Described initially as a midway compromise between classic reductive materialism and opposed forms of dualism, this new outlook on existence combines formerly antithetical features from both sides of the old spiritual–physical dichotomy into a single consistent worldview synthesis (Gardner, 1985; Popper, 1978; Slaatte, 1981; Sperry, 1965, 1983; Starr, 1984). As a framework for belief, the new view of reality retains and integrates what seems most valid from each of the earlier views. It accepts mental and spiritual qualities as causal realities, but at the same time denies that they can exist separately in an unembodied state apart from the functioning brain. The new scheme manages to integrate the physical with the mental, the objective with the subjective, fact with value, free will with determinism, and positivistic thought with phenomenology (Slaatte, 1981; Sperry, 1985).

The consciousness revolution of the 1970s can be seen to represent a renunciation by a major scientific discipline of the reductionist "quantum mechanics philosophy" that had previously dominated scientific thinking. (This does not, of course, imply any renunciation of quantum theory per se.) At the same time, it represents also a further undermining of opposed dualistic thinking in philosophy and theology by explaining and accepting mind and the subjective entirely within a monistic framework (Natsoulas, 1987; Sperry, 1980). Instead of excluding mind and spirit, the new outlook puts subjective mental forces near the top of the brain's causal control hierarchy and gives them primacy in determining what a person is and does.

The traditional assumption in neuroscience, which was also long implicit in behaviorist philosophy, physics, biology, chemistry, and all the natural sciences, supposes everything to be determined from below upward, following the course of evolution (Armstrong, 1968; Feigl, 1967; Klee, 1984; Skinner, 1964, 1971). In this materialist "microdeterministic" view of nature, all mental and brain functions are determined by, and can be explained in terms of, brain physiology or neuronal activity. In turn, the neuronal activity can be explained in terms of biophysics and biochemistry—with everything being determined and accounted for eventually in terms of subatomic physics and quantum mechanics—or some even more elemental "theory of everything."

The new mentalist–cognitive tenets replace this traditional reasoning with another. The control from below upward is retained but is claimed to not furnish the whole story. The full explanation requires that one also take into account new, previously nonexistent, emergent properties, including the mental, that interact causally at their own higher level and also exert causal control from above downward. The supervenient control exerted by the higher over lower level properties of a system, referred to also as "macro," "molar," or "emergent" determinism (Klee, 1984; Sperry, 1986, 1987), operates concurrently with the "micro" control from below upward. Mental states, as emergent properties of brain activity, thus exert downward control over their constituent neuronal events—at the same time that they are being determined by them. Microdeterminism is integrated with emergent determinism.

A simple analogy for the kind of higher (supervenient, downward) control envisaged compares it to that exercised by the programs of television from different channels over the flow of electrons in a TV receiver. Much as a TV program controls the electron flow, a train of thought in the brain, with its own cognitive dynamics and laws of progression, controls the brain's neuronal firing patterns. No interference with the underlying physics of neuronal discharge or electron emission is involved. Nothing in electron physics, however, can explain the sequencing of the TV program, that is, the plot development in a movie, the content of the news, or the comedian's delivery. Similarly, the laws of biophysics and biochemistry are not adequate to account for the cognitive sequencing of a train of thought. The interlevel, upward and downward controls work conjointly and continuously during the onward progression of events in time and are less sequential than spatial, coherent, and structural. The analogy breaks down if carried too far, of course, because the programs of the brain differ from those of television in that the brain can generate or create, largely from within itself, its own mental programs.

The principle of control from above downward, referred to as "downward causation" by Donald Campbell (1974), Karl Popper (Popper, 1978; Popper & Eccles, 1977), myself, and others (Szentagothai, 1984) can be applied at all levels throughout nature. This outlook says that we and the universe are more than just swarms of "hurrying" atoms, electrons, and protons, that the higher holistic properties and qualities of the world to which the brain responds, including all the macrosocial phenomena of modern civilization, are just as real and causal for science as are the atoms and molecules on which they depend. The same principle of emergent control has more recently been invoked (Grene, 1987) to explain the units of causal selection in evolution, contradicting the extreme sociobiologic reductionisms that entered ethological thinking during the latter 1970s (Wilson, 1975).

The religion–science tensions of the past can be ascribed, not only to religion's reliance on dualistic super-

natural explanation, but also in no small measure to the failure within science to recognize the causal reality and autonomy of the higher level forces. Successful merging of mainstream scientific and religious belief will logically require that science in general follow the lead of psychology and give up its traditional microdeterministic view of reality to accept the progressive emergence of higher, more evolved forms of causal control. Although this theoretic change might make little difference in physics, chemistry, molecular biology, and so on, it is crucial for the behavioral, evolutionary, social, and human sciences. In the rethinking of basic assumptions that have served to keep science and religion at odds, religion, on its side, would have to relinquish reliance on dualistic explanations. This it seems does not pose a major obstacle for modern theology (e.g., Burhoe, 1970; Byers, 1987; Kaufman, 1985; Starr, 1984).

Free Will, the Fact–Value Dichotomy, and a Naturalistic Global Ethic

The turnabout on consciousness, involving a core principle of causal determinism of wide ontologic application, with changed perceptions of the self and physical reality, has potential for effecting pervasive global changes in human outlook. Some further conceptual consequences with special bearing on the religion–science controversy include (a) a resolution of the free will–determinism paradox that preserves moral choice and responsibility, (b) revisions in the traditional fact–value dichotomy that allow the derivation of ethical values from the factual knowledge of science, and (c) emergence of a science-based ideology for moral directives that, unlike currently prevailing schemes for ordering human priorities, holds promising prospects as the key to quality survival and a sustainable civilization (Brown, 1981; Daly, 1977; Kaufman, 1985; Schell, 1982; Sperry, 1983).

The free will–determinism paradox is resolved in mentalist theory by preserving both free will and determinism and integrating the two. "Micro" and "macro" forms of determinism are both retained and combined in such a way that, for any willed action, the sequence of antecedent causes in the brain includes subjective wants, purpose, choices, value judgments, and other subjective attributes of the cognitive self (Deci, 1980). Thus, from the standpoint of mentalist doctrine, as from that of common experience, one can will to do whatever one subjectively chooses, decides, or *wants* to do. The whole process is still controlled or determined, but primarily by emergent cognitive, subjective intentions of the conscious/unconscious mind (Grenander, 1983; Ripley, 1984). Thus, freedom to will our actions as we wish is real, as are moral choice and responsibility. Yet none of these is uncaused. Uncaused behavior would be capricious, random, and out of our own control.

A changed science–values relation is another logical consequence of the new mentalism. Instead of maintaining the traditional unbridgeability of scientific fact and values, cognitive theory brings the two together in brain function. If conscious mental values not only arise from but also influence physical brain action, it then becomes possible to integrate subjective values with objective brain function and its physical consequences. Current concepts of cognitive processing make it possible to go from fact to value and from perception of what "is" to what "should" be (Sperry, 1985). The progression is not achieved directly but via cognitive intermediaries such as belief, understanding, perspectives, and the like. For example, it is commonly accepted that scientific facts shape one's understanding and beliefs. These in turn determine what one values and color one's ideas about how things ought to be. Further, the cosmology of macrodeterminist science no longer destroys values and meaning through reduction of everything to elemental physics. The combined result has brought a major turnaround since the mid 1960s in the science–values relation (Edel, 1980; Graham, 1981), opening the way as well for corresponding developments in respect to an integration of scientific and religious belief.

In the revised, macrodeterminist outlook it becomes possible not only to build a descriptive science of values (Rottschaefer, 1987) but also to get ethico-religious values from science in a prescriptive sense (Fletcher, 1987; Sperry, 1985). Historically, moral values have commonly been determined on the basis of fit with some accepted supreme plan for existence imputed to a divine intellect (Fletcher, 1987). Deriving values from science means a reconception of such master schemes of supernatural origin into one that is consistent with scientific evidence. This was deterred during the materialist–behaviorist era because science seemed to point to a cosmos lacking in values and higher meaning. Macromentalist theory, in contrast, provides a master plan based in emergent evolution, which, though not preconceived but gradually self-determined in its design, is nevertheless replete with intrinsic directives for determining values.

A primary source is found in the elaborate system of innate value preferences inherent in the human cognitive structure as a part of nature's genetic provisions for survival (Pugh, 1977); this system includes a basic social conscience, which is deemed central to morality (Fletcher, 1987). Values acquired later through experience are built on and tend normally to mesh with the inherent system and its associated drives, including a strong motivational thrust not only to survive in the status quo but also to strive for continued improvement. Values are both directly embodied and also implicit in this system and set guiding constraints for further derivation of other values.

More than this, when mentalist theory shows a revised scientific picture of both human and nonhuman nature and the forces in control, the result inevitably causes alterations at the most fundamental level of existent value and belief systems. A society's sense of the sacred, of what is most important in deciding priorities, good and evil, and how things "ought to be" rests ultimately on beliefs about our nature and origins and the kind of universe we live in. The mentalist paradigm establishes a new foundational framework for such beliefs.

Union. The conflicting superpower ideologies that pit capitalism against communism, atheism against theism, materialism against spiritual idealism, centralized controls against distributed free enterprise, religious freedom and separation of church and state against the opposite, and so on are widely perceived to be the single greatest obstacle to world accord (Hudgens, 1986; Speer, 1985). These differences cannot be resolved by technological developments.

Psychology's new mentalist doctrine extends into and challenges the theoretic foundations of these two opposed systems, offering some much-needed compromise. It agrees with the Soviet rejection of dualistic otherworldly guidelines in favor of empiric verifiable truths as a basis on which to mold social structure. At the same time, it concurs with Western rejection of dialectical materialism and of related Marxist views that society is determined primarily from below upward by material, economic, and basic subsistence forces. Although the essential importance of the lower level forces is recognized and accepted in the new outlook, priority is given to the higher, more evolved spiritual and idealistic dimensions in the cognitive structure. The implication is not to try to uplift or change human nature, but to use its highest, most evolved properties to control the less evolved ones through law and government for the common good.

Soviet social philosophy, in its reliance on earlier science during formative years, can be seen in the light of today's science to have overestimated the plasticity and homogeneity of human nature, as well as having underestimated the importance of some of the personal motivational structures. Both sides can thus claim to have been right on major issues, while both give way on others. Compromise in the new macrodeterminist cosmology of science would allow the two superpowers to begin to understand each other's differences within the same single reference frame instead of being totally at odds with incommensurable ideologies. Much the same applies to other countries and communities currently operating from mutually incompatible worldviews. Taken as an ideological base for world government, the new reality paradigm of behavioral and cognitive science could foreseeably foster and sustain the types of social change and value priorities needed if civilization is to survive and continue on a forward course.

Remaining Issues

Conflict between scientific and religious belief gains added concern today in the context of worsening world conditions and an imperiled future. We are learning the hard way that real, lasting solutions to the major global ills of our times are not found in "crisis-management" techniques that treat the manifest symptoms directly and separately and rely on endless advances in applied science and technology. In the absence of world population controls, such advances result in vicious-spiral build-ups that need to be broken at the source through changes in human behavior and attitude, changes that can be effected most strategically at the level of the sustaining value and belief systems (Brown, 1981; T. E. Jones, 1980; Sperry, 1983). The great power of these reigning belief systems, as determinants of behavior, decision making, and social policy can hardly be overrated. In today's crowded world, the beliefs of millions of followers of this or that religion—which influence the growth rate of world population, the ability of human communities to coexist, and the treatment of nature, irreplaceable resources, other species, and so on—have tremendous consequences that become compounded in succeeding generations. Religious and ideologic beliefs, in particular, incorporate or imply a worldview or life-goal framework that then determines public judgment of how things ought to be in the world, the cultural sense of value, and ethical concepts of right and wrong and of social justice.

A crucial issue brought into new focus by the macromentalist outlook can be stated as follows: In ideologic or religious belief, is it any longer necessary or desirable to go beyond the limits of present knowledge and empirical verification? In other words, should humankind put its faith in the kind of truth within which scientific and religious belief are in accord, or should we continue to reach beyond this realm into others of less certainty? The answer, of course, is critical to many other issues.

Until the 1970s there seemed little choice; theology could hardly restrict itself to beliefs consistent with scientific doctrine, beliefs that, in the final analysis, became mutually exclusive and incompatible with the aims of religion. New reasons can be seen in today's changed outlook, however, for basing our belief systems, at least at the social level and *for purposes of legislation,* firmly within the realm of empirical verification. The principal argument relates to the power of belief systems in determining social policy and the future and says in effect that we can no longer afford the risk of mistakes in this critical area. Even a failure to correct past errors could easily mean our demise. If we do not succeed soon in adopting a theology that will protect the biosphere and if we do not find a common neutral belief system and global ethic on which most nations and most cultures and faiths can agree, then shortly there may not be any nations or theologies or sciences to worry about—or even any biosphere. In today's scenario, the issue of survival (or better, *quality* survival) logically takes overwhelming precedence over all other moral imperatives (Kaufman, 1985; Schell, 1982). In this context, the new mentalist position of behavioral and cognitive science seems to hold promise, not only as a more valid paradigm for all science but also for all human belief.

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